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✓ CULTURE OF Orchids

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CULTURE OF ORCHIDS

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Introduction

Usually, interest in orchid culture centers in the growing of tropical orchids in greenhouses. This began in Europe about 200 years ago and was receiving some attention in this country 100 years later. Orchid breeding began a little later, and since then interest has increased more rapidly, and many fine private collections have been built up. Orchids are now grown by specialists, who sell the plants and cut flowers.

Orchids are mostly tropical or subtropical, although some are native in north-temperate and subarctic regions. They are either terrestrial, growing in soil, or epiphytic, that is, living on trees or on rocks, but not obtaining their sustenance from them. The hardy native species of the northeastern United States require conditions like those needed by rhododendrons and similar plants, but most of the orchid species require greenhouse conditions and are grown in soil, in fiber, or on supports that are a substitute for the trees or rocks of their native habitat.

The following directions are designed to aid the beginner in growing orchids. Further information may be obtained from the many books on the subject, some of which are likely to be available in public libraries. A partial reference list is given on page 7.

Propagation

Orchids are propagated by division (fig. 1), cuttings, or seeds. Vegetative propagation insures the reproduction of the varieties, as hybrid orchids do not come true from seed, though orchid species vary but little from the type when grown from seed. Divisions are made by cutting the rhizomes several joints back from the growing portion, which causes the older part of the rhizome to break into renewed growth. Dendrobiums are examples of the sorts propagated by cuttings. The old canes of these are laid on wet sphagnum until growth starts and then they are cut up into small pieces and potted as growth develops.

Raising orchids from seed is a slow process, and they require most careful handling. On an average, 4 to 8 years are required from seed to bloom. The seeds, which are nearly as fine as dust, should be sown as soon as ripe on one of the three sorts of seedbeds now often used. The oldest method is to sow the seed on compost in a pot in which a plant of the same genus is growing. This is done to insure the presence of the symbiotic fungi that live on the roots of most orchid plants. A later method is to sow the seeds on chopped sphagnum moss which previously has been sterilized and then has been inoculated with roots cut from growing parent plants. The latest method is to sow sterilized seeds in flasks specially prepared and sterilized. These flasks contain agar, nutrient mineral solutions, and a suitable sugar in proper proportions, with or without the symbiotic fungus. Investigations are being made of these intricate but interesting problems at the Missouri Botanical Gardens, St. Louis, Mo., and at Cornell University, Ithaca, N. Y.

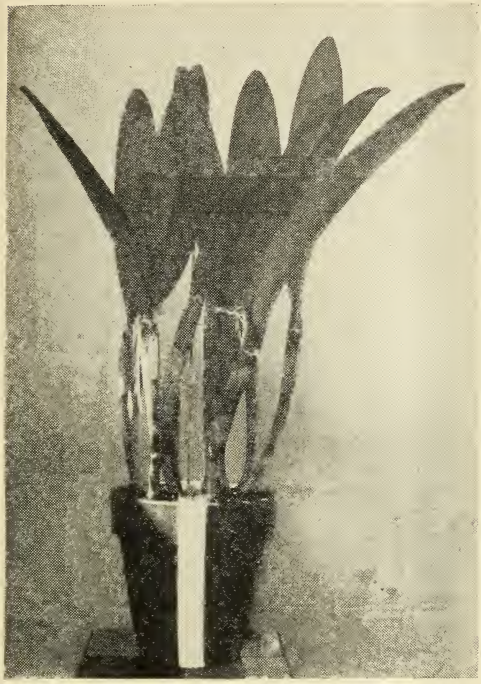

FIGURE 1.—Method of propagation by division. The ribbon across the pot shows where the division should be made. Each division will have two leads, or new growths.

Kinds to Grow

Among the most interesting and easily managed of the orchids are the cattleyas and the laelias; also some of their hybrids. These are known as corsage orchids. They will do well in a Wardian case. (See p. 5.) *Cattleya trianae* is a winter bloomer; *C. percivaliana* flowers from Thanksgiving to Christmas; *C. schroederiana* is known as the Easter-blooming orchid, and *C. mendeli* and *C. mossiae* will bloom in the spring. *C. skinneri* also flowers in the spring, and *C. bowringiana* in the autumn. Among the popular species of *Laelia* recommended are *L. anceps* and its several varieties, all of which flower during the winter months, *L. autumnalis*, a later fall bloomer, and *L. gouldiana*, a good winter blooming species. Among the hybrid cattleyas recommended for a beginner are Aphrodite, Enid, Fabia, Canhamiana, and Hardyana, all fine flowering hybrids. In the ladyslipper or cypripedium group such species as *Cypripedium insigne*, the golden ladyslipper, and its varieties Harefield Hall and Sanderae can be recommended, also *C. callosum* and *C. villosum*. Other genera and species of interest to a beginner are: *Lycaste skinneri*, recently named the national flower of Guatemala; *Miltonia vexillaria* and *M. bleuana*, the pansy orchids; *Oncidium sphacelatum* and *O. splendidum*, spray orchids; *O. papilio*, the butterfly orchid; *Phalaenopsis schilleriana*, the moth orchid; *Peristeria elata*, the dove orchid; *Brassia verrucosa*, the spider orchid; *Dendrobium nobile*, the Noble dendrobium, with its many varieties; *Laelia albida*, white Mexican orchid; *L. anceps*, pink Mexican orchid; *L. autumnalis*, autumn flowering laelia; *Odontoglossum* *grande*, sometimes called, rather inappropriately, the baby orchid; *Gongora maculata*, the Punch and Judy orchid; *Zygopetalum mackayi*, the old-fashioned fragrant orchid.

For commercial purposes the grower should study especially the culture of the species included in the genera *Calanthe*, *Cattleya*, *Coelogyne*, *Cypripedium*, *Dendrobium*, *Laelia*, *Odontoglossum*, *Oncidium*, and *Vanda*. Within each genus are many species that within themselves furnish considerable range of color and length of blooming season.

Greenhouse Culture

Orchids have been regarded as difficult plants to grow, but the indoor kinds require no more attention than do other greenhouse subjects. Their requirements are different from most greenhouse plants, but now that these requirements are better understood than formerly they are not more difficult to provide than are those for other plants, and a satisfactory response is as much to be expected as with most greenhouse subjects. Greenhouse culture of plants requires more attention than outdoor culture. Alternation of clouds and sunshine when artificial heat is being used is a special cause of frequent attention being required during the day. This often necessitates changes in amount of ventilation at frequent intervals or the application of water either to the plants or to maintain humid air conditions when such application was not anticipated.

It has been demonstrated that orchids can be grown in ordinary greenhouses where a suitable temperature is maintained and the light is adequately modified. It is not necessary to build a special house in order to grow them. Exhibition plants can be produced in all types of greenhouses, from old ones of simplest construction to those equipped with the most modern improvements. An orchid culturist on a small scale can utilize the upper space in his greenhouse by suspending the plants from the roof, thereby having the benches or tables available for other plants that thrive under the same temperature and light conditions.

Temperatures

Orchids are commonly grown in greenhouses especially devoted to them. If greenhouses are built for the purpose they must be so planned that they can be easily heated in winter, a naturally moist atmosphere can be maintained, and at all times of the year a carefully controlled free circulation of air can be secured. The houses usually run north and south except the coolest house, used for odontoglossums, which is commonly a lean-to house facing north. There should be separate houses or divisions in which different temperatures can be maintained. The warm house requires a winter temperature of 60° to 70° F. at night with a 10-degree rise by day. This is used for dendrobiums, phalaenopsis, calanthes, etc. The intermediate or cattleya house requires a winter temperature of 60° to 65° by night and 65° to 70° by day. It is used chiefly for cattleyas, laelias, some odontoglossums, and other types. The cool or Mexican house is another intermediate house, requiring a night temperature slightly lower than the last. It is used for coelogynes, Mexican laelias, and many oncidiums and odontoglossums. The cold or odontoglossum house has a winter night temperature of 50° to 55° with 60° to 65° by day. It is used chiefly for odontoglossums. Special devices for shading are necessary in houses of all types.

The temperatures may rise abnormally during sunshine, and very frequently during summer days it may exceed those recommended. Although care is necessary in spring and late fall to keep the temperature as steady as possible, this is not as true in summer, when the temperature may run up to advantage provided there is a circulation of fresh air among the plants. During very cold days and nights in winter, a fall of a few degrees below the prescribed temperatures will not injure the plants, especially if the air is dry.

One of the principal errors of the grower is to keep the temperature too high. Although it is true that sufficient heat is a factor in successful orchid cultivation, temperatures above those indicated are not required. Temperatures that are too high are likely to cause soft, succulent growth that is subject to disease.

Shading

Orchids need shade from the direct sun. Two types of shading are used: One is a wood-slat roller on runners a foot above the glass; the other is a composition of white lead and gasoline painted or sprayed on the glass. The wood-slat shade is more popular on the small orchid house than the paint shade. It has a decided advantage in that it can be rolled up during dull weather and thus allow more light in the greenhouse.

There is no definite time to install or apply shading as light intensities differ with localities, but shade must be installed or applied in accordance with the seasonal change in sunlight. Shade should be ready for use in March in Massachusetts, in Chicago, Ill., in Montana, and in Portland, Oreg. It probably would be needed in February in Washington, D. C., Cincinnati, Ohio, St. Louis, Mo., Denver, Colo., and Sacramento, Calif. In North Carolina, Oklahoma, and Fresno, Calif., it would likely be needed all winter. Orchids are sometimes grown throughout the year under lath shades without glass in the southern half of Florida.

Ventilation

Orchids revel in fresh air, and throughout the summer months ventilation can be given very freely. In the spring and fall care must be taken that the plants are not chilled when the ventilators are open. During the winter months a slight crack for air during the middle of the day is sufficient. Ventilation should not be so liberal as to dry the atmosphere unduly.

Watering

Orchids should not be overwatered. The plants, with the exception of the ladyslipper (*Cypripedium*), should be allowed to dry out thoroughly before being watered again, but at no time should water be so restricted as to cause undue shriveling of the pseudobulbs. There is no set time for watering, as in dull weather the plants will take longer to dry out than on clear, bright days. A light syringing of the plants as often as three or four times a day in hot weather is beneficial to them.

Overwatering is especially injurious when plants are starting into growth either after being transplanted or after a rest period, as too much water may cause the young shoot to rot or damp-off. Water should also be reduced as soon as growth is finished. A moist atmosphere is important at all times, but excessive atmospheric moisture must be guarded against if the temperature should be below that normally suited to the variety or if the weather is cloudy. Syringing can be supplemented by keeping the walks and areas under benches moist, and by keeping the material that is between or under the pots wet, whether it is coke, gravel, or cinders.

Potting

Potting of orchids is usually done soon after the plant has finished flowering, when it has become dormant. The plant is taken from the pot, and all decayed material, dead roots, and useless pseudobulbs and rhizomes are removed. Only the leading healthy part with five or six pseudobulbs should be potted. Care should be exercised to select a pot that is neither too small nor too large, one having a diameter about 2 inches greater than the width of the plant being about right, as this will allow for two new growths during 2 years. Fill the pot one-third full of clean drainage material such as broken pots or cinders mixed with some charcoal. Place the plant in the pot with the basal cut against one side with a little suitable compost beneath it; then fill the pot and make the compost firm about the plant. The growing portion of the plant should be slightly above the rim of the pot.

The best potting medium for the epiphytic orchids is Osmunda fiber, either chopped or shredded, with all dust removed. In any case the drainage layer should be covered with sufficient coarse material to prevent the compost from working down into it. The terrestrial kinds that are dwellers in the ground should have a compost of rotted sods, chopped live sphagnum moss, and leafmold from decaying oak leaves.

A potting stick facilitates the firming of the Osmunda fiber or other compost about the pseudobulbs and rhizomes. Such a stick is made from a piece of hardwood, a piece of the shaft from a broken rake, hoe, broom, or other tool being excellent material. A piece 7 to 9 inches long is desirable, with one end rounded off to fit the palm of the hand, and 4 inches of the other end made into a paddle shape with the edge not too sharp (fig. 2). It is well to have two sizes, adapted to pots and plants of different sizes.

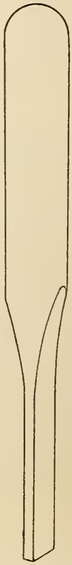

FIGURE 2.—An orchid potting stick.

After potting, water should be withheld for about 2 weeks with the exception of a mistlike spray applied to the tops daily until growth has developed about half an inch; after this, waterings may be gradually increased as the plants grow. After the rest period the plant puts out new roots that quickly penetrate the fresh potting material, thus stimulating growth and the development of pseudobulbs.

House Culture

Orchids may be grown as house plants if extra care is exercised to provide the special conditions they need (fig. 3). The Wardian case is probably the simplest way of providing suitable conditions, as it is virtually a miniature greenhouse inside the home. It is a space tightly enclosed by glass on five sides with the bottom watertight and suitably arranged to hold soil or the receptacles for holding the orchids. When the bottom is not covered with soil, 2 to 3 inches of coke, charcoal, sphagnum moss, or other suitable material may be used to hold an abundance of water and permit its evaporating into the air of the case. Sometimes the plant containers are slightly sunk into this material or placed on a staging above it. The tight case prevents the moisture from escaping; and when the air becomes saturated, the moisture condenses and returns to the soil or other cover from which it may again evaporate to provide a saturated atmosphere. The case is placed near a window with strong light. The enclosure helps to maintain uniform temperatures and humidity, but daily attention to watering and syringing, with adequate wetting of the material used on the bottom, is usually necessary. Ventilation by slightly raising the top occasionally is also required.

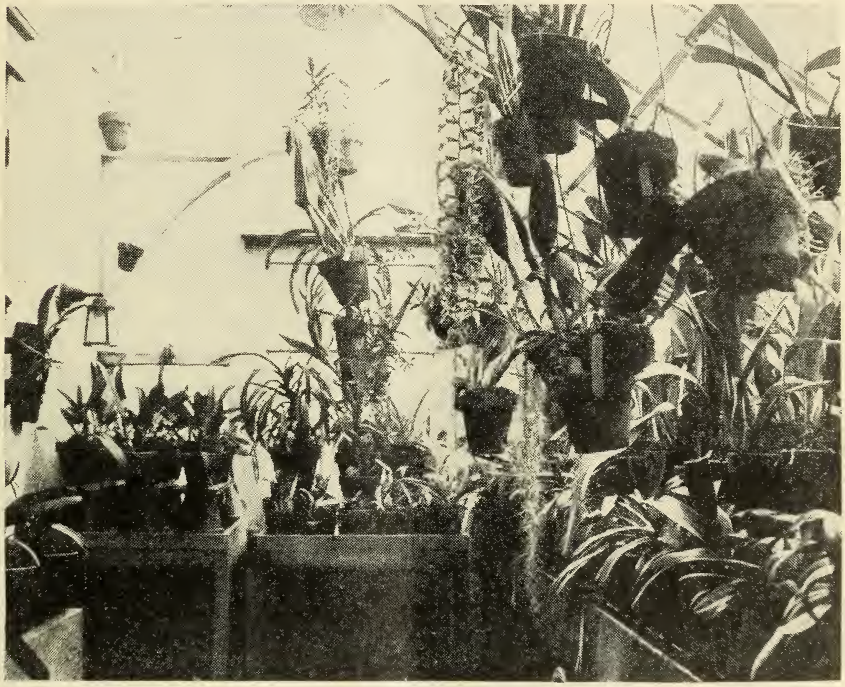

FIGURE 3.—A small orchid conservatory.

If a Wardian case is not available, a watertight tray 5 to 6 inches deep can be used. In this, 2 to 3 inches of coke, charcoal, or sphagnum moss should be placed and 2 inches above it a slat rack on which the pots may stand. If the tray is kept wet, moisture will evaporate freely and pass up over the plants. This, combined with syringing the plants twice a day, will to some degree simulate the moist atmosphere of a greenhouse. The plants will require more water in winter than in summer, owing to the dry atmospheric conditions of the dwelling house. During the summer months they may be placed in a shady place outdoors, either on the porch or under a tree.

Diseases and Insect Pests

Orchids in common with other plants are subject to the attacks of diseases and insect pests. If these occur, information concerning them and methods of eradication may be obtained by writing to the U. S. Department of Agriculture, Washington, D. C.

List of Reference Books

The following books are a useful introduction to the extensive and highly specialized literature of the orchid.

Bailey, L. H., and Miller, Wilhelm.
1914–17. THE STANDARD CYCLOPEDIA OF HORTICULTURE . . . 6 v., illus. New York and London. (See v. 4, pp. 2380–2403.)
Curtis, Charles H.
1910. ORCHIDS FOR EVERYONE. 234 pp., illus. New York.
Darwin, Charles R.
1903. THE VARIOUS CONTRIVANCES BY WHICH ORCHIDS ARE FERTILIZED BY INSECTS. Ed. 2, rev., 300 pp., illus. New York.
Sanders, [St. Albans].
[1906.] SANDER'S ORCHID GUIDE, CONTAINING ALL THE BEST KNOWN SPECIES, VARIETIES, AND HYBRIDS OF ORCHIDS IN CULTIVATION . . . 256 pp. St. Albans, [England].
Veitch, James & Sons.
1887–94. A MANUAL OF ORCHIDACEOUS PLANTS CULTIVATED UNDER GLASS IN GREAT BRITAIN. 2 v., illus. London.
Watson, Wm.
1903. ORCHIDS: THEIR CULTURE AND MANAGEMENT. Rev. ed., 559 pp., illus. New York and London.
White, Ed. A.
1939. AMERICAN ORCHID CULTURE. Ed. 2, rev. and enl., 256 pp., illus. New York.
White, W. H.
1902. THE BOOK OF ORCHIDS. 118 pp., illus. New York and London.
Williams, Benjamin Samuel.
1894. THE ORCHID GROWERS' MANUAL . . . Ed. 7, rev. and enl., 796 pp., illus. London.
The American Orchid Society Bulletin (a monthly publication). Louis O. Williams, Editor. Botanical Museum, Harvard University, Cambridge, Mass. David Lumsden, Secretary, 115 Glenbrook Road, Bethesda, Md.

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